# Two Cases of Pediatric Acral Cutaneous Calcinosis with Transepidermal Elimination Presenting as Skin-colored Papules

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## Abstract

We present two pediatric cases of acral dystrophic calcinosis. Dystrophic cutaneous calcification can occur in a variety of disorders that are usually associated with prior skin damage. It represents the deposition of insoluble calcium salts in the presence of tissue damage without abnormal systemic calcium levels or defective calcium metabolic regulation. A papular or warty acral lesion in the pediatric population should prompt the diagnostic possibility of a localized acral dystrophic calcinosis, especially if there is a clinical history of multiple needle sticks. It is important that physicians are aware that prior needle prick trauma (i.e., neonatal) can result in cutaneous dystrophic calcification, and to consider this entity whenever confronting a warty or papular lesion located in an acral site in the pediatric population.

## Introduction

Many different pathological conditions can result in dystrophic cutaneous calcification; however, most commonly they are associated with prior skin damage without abnormal systemic calcium levels or defective calcium metabolic regulation. Deposition of insoluble calcium salts occurs in damaged tissue, and when localized, it can result in a warty papule with a clinical differential diagnosis including periungual fibroma, cyst, verruca vulgaris and fibrokeratoma, among other conditions. Identifying the correct lesion is important when determining the clinical management, as some lesions require treatment (e.g., verruca vulgaris), some may need further investigation (e.g., ruling out tuberous sclerosis when periungual fibromas are present), and some do not require further intervention, as with cutaneous dystrophic calcinosis. Prior needle stick trauma (i.e., neonatal) has been reported to result in cutaneous dystrophic calcification, and it is important for physicians to consider this entity within the pediatric population.

## Case Report

We present two pediatric cases of acral dystrophic calcinosis. Such lesions can clinically appear warty or as a papule. This entity is probably more common than is actually reported. A papular or warty acral lesion in the pediatric population should prompt the diagnostic possibility of a localized acral dystrophic calcinosis, especially if there is a clinical history of multiple needle sticks.

The first case involves an 11-month-old male who presented with a flesh-colored papule on the right index finger since birth. The lesion began as two small white “dots” and had increased to the size of 5 mm x 4 mm. The clinical differential diagnosis of this periungual, flesh-colored papule included periungual fibroma, fibrokeratoma, pyogenic granuloma, connective tissue nevi, myxoid cyst and verruca vulgaris. Tissue sections from a biopsy revealed a distinct nodular mass of subepidermal dystrophic calcification with overlying reactive acanthosis and evidence of transepidermal elimination of calcific material (Figure 1).

The second case involves a 1-year-old female with a 4 mm, white-tan papule on the left heel. Differential diagnosis included verruca vulgaris and cyst. Skin biopsy specimen showed only stratum corneum, but revealed disrupted acral stratum corneum with intracorneal deposition of granular calcified material (Figures 2 and 3). The pathologic diagnosis on both cases was dystrophic cutaneous calcification (consistent with prior needle stick trauma).

## Discussion

Dystrophic calcification represents the deposition of insoluble calcium salts in the presence of tissue damage without abnormal systemic calcium levels or defective calcium metabolic regulation. Calcium is important in cellular proliferation, differentiation and regulation of cell-to-cell adhesion. When tissue is damaged, cellular membrane disruption can allow calcium influx and intracellular crystallization. The acidity produced by cellular damage can also inhibit anti-calcifying processes. Dystrophic cutaneous calcification can occur in a variety of disorders that are usually associated with prior skin damage. Examples of these conditions include autoimmune connective tissue diseases, panniculitis, genetic disorders, infections and neoplasms, among many others. Our patients, in both cases, did not present with any biochemical, metabolic or genetic abnormalities.

The verrucous papule on the index finger (in the first case) and the papule from the heel (in the second case) both showed subepidermal dystrophic calcification secondary to traumatic needle-stick injury. A similar case of dystrophic calcification secondary to needle-prick trauma has been reported by Sakmann et al., who theorized that the needle prick introduced epidermal implantation cysts that led to dystrophic calcification of the cutaneous tissue. The clinical differential diagnosis of skin-colored papules includes periungual fibroma, fibrokeratoma, connective tissue nevi, myxoid cyst and verruca. Periungual fibroma belongs to a group of lesions called cutaneous angiofibromas, which are dome-shaped lesions composed of a collagenous stroma.
with increased dermal fibroblasts and dilated, thin-walled blood vessels. Periungual fibroma is considered a major diagnostic criterion for tuberous sclerosis, seen more commonly in adults.\textsuperscript{5,6} Fibrokeratomas are uncommon, benign lesions that present in the finger of middle-aged adults. They consist of solitary, pink to skin-colored, exophytic papulonodules that may be slightly keratotic with a collarette of elevated skin. They are composed of blood vessels surrounding think collagen bundles.\textsuperscript{7} Connective tissue nevi, also known as collagenomas, are thin, skin-colored nodules or plaques that arise during childhood or can be present at birth. The histopathological evaluation consists of increased dermal collagen bundles without an increase in fibroblasts.\textsuperscript{5} Myxoid cysts are the most common nail tumors, often seen in middle-aged women. They are soft nodules located in the proximal nail fold of fingernails that often drain spontaneously.\textsuperscript{8}

Verruca vulgaris, also known as common warts, are exophytic, hyperkeratotic, dome-shaped papules or plaques that often present on the fingers or dorsum of the hands, but can occur anywhere in the skin surface, especially in trauma-prone sites. They can have characteristic punctate black dots as a result from thrombosed capillaries. Elongated rete ridges, marked acanthosis, and parakeratosis overlying papillomatosis are seen on histopathological examination.\textsuperscript{9}

Histopathologic evaluation and a good history and physical examination and review of systems are very important when trying to distinguish between these conditions.

References

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